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REMARKS/ARGUMENTS

In view of the foregoing amendments and the following remarks, the applicants respectfully submit that the pending claims comply with 35 U.S.C. § 112, are not anticipated under 35 U.S.C. § 102 and are not rendered obvious under 35 U.S.C. § 103. Accordingly, it is believed that this application is in condition for allowance. If, however, the Examiner believes that there are any unresolved issues, or believes that some or all of the claims are not in condition for allowance, the applicants respectfully request that the Examiner contact the undersigned to schedule a telephone Examiner Interview before any further actions on the merits.

The applicants will now address each of the issues raised in the outstanding Office Action.

Objections

Claims 5 and 18 are objected to because each of the claims recited "a InP" in line 2. The applicants respectfully request that the Examiner reconsider and withdraw this objection in view of the foregoing amendments to these claims.

Double Patenting

Claims 1-3 are rejected on the ground of non-statutory obviousness-type double patenting as being

unpatentable over claims 1-3, 8-22 and 26-28 of U.S. Patent No. 7,491,491 ("the Arnold patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the foregoing amendments to claim 1, which now recites:

... at least two optical cavities, wherein each of the at least two optical cavities is optically coupled with the optical carrier, wherein a first of the at least two optical cavities has a surface including first oligonucleotides complementary the target substance, and *wherein a second of the at least two optical cavities has a surface including second oligonucleotides complementary to a second oligonucleotide having only a single nucleotide mismatch with the target substance, ...* [Emphasis added.]

This amendment is supported, for example, by Figures 4 through 5B and section 4.2.4 of the specification.

Claims 1-3, 6-9, 14-16, 19-22 and 31 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 8 and 9 of copending Application No. 12/350,000 in view of U.S. Patent Application Publication No. 2002/0097401 ("the Maleki publication"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the foregoing amendments to independent claims 1 and 14.

Claims 1, 2, 4-15, 17-27, 31 and 33 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable

over claims 8 and 9 of copending Application No. 12/350,000 in view of U.S. Patent Application Publication No. 2004/0023396 ("the Boyd publication"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the foregoing amendments to independent claims 1 and 14.

**Rejections under 35 U.S.C. § 112**

Claims 6, 7, 19 and 20 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Although the applicants believe that these claims properly limited, by inference, the claimed oligonucleotides included on the surface of an optical cavity, these claims have been amended to more clearly relate the claimed features of the (first) oligonucleotides of the sensor or system claimed.

**Rejections under 35 U.S.C. § 102**

Claims 1-3, 6-9, 14-16, 19-22 and 31 are rejected under 35 U.S.C. § 102(a,e) as being anticipated by the Maleki publication. The applicants respectfully request

that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Independent claim 1, as amended, is not anticipated by the Maleki publication at least because the Maleki publication does not teach a sensor including at least two optical cavities, wherein each of the at least two optical cavities is optically coupled with the optical carrier, wherein a first of the at least two optical cavities has a surface including first oligonucleotides complementary the target substance, and **wherein a second of the at least two optical cavities has a surface including second oligonucleotides complementary to a second oligonucleotide having only a single nucleotide mismatch with the target substance**, in combination with the other features of claim 1. Since claims 2, 3 and 6-8 directly or indirectly depend from claim 1, they are similarly not anticipated.

Independent claim 14, as amended, is not anticipated by the Maleki publication at least because the Maleki publication does not teach a processor for determining a measurement of the target substance using **a difference** in shifts between the resonances detected by the light detector, in combination with the other features of claim 14. This amendment is supported, for example, by Figure 5B and section 4.2.4 of the specification. Since claims 15, 16, 19-22 and 31 directly or indirectly depend from claim 14, they are similarly not anticipated.

Claims 1, 2, 4-15, 17-27, 31 and 33 are rejected under 35 U.S.C. § 102(e) as being anticipated by the Boyd

publication.. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Independent claim 1, as amended, is not anticipated by the Boyd publication at least because the Boyd publication does not teach a sensor having at least two optical cavities, wherein each of the at least two optical cavities is optically coupled with the optical carrier, wherein a first of the at least two optical cavities has a surface including first oligonucleotides complementary the target substance, and **wherein a second of the at least two optical cavities has a surface including second oligonucleotides complementary to a second oligonucleotide having only a single nucleotide mismatch with the target substance**, in combination with the other features of claim 1. Since claims 2 and 4-13 directly or indirectly depend from claim 1, they are similarly not anticipated.

Independent claim 14, as amended, is not anticipated by the Boyd publication at least because the Boyd publication does not teach a processor for determining a measurement of the target substance using **a difference** in shifts between the resonances detected by the light detector, in combination with the other features of claim 14. Since claims 15, 17-27, 31 and 33 directly or indirectly depend from claim 14, they are similarly not anticipated.

**Rejections under 35 U.S.C. § 103**

Claims 1-4, 6-9, 14-17, 19-22, 31 and 32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,583,399 ("the Hunziker patent") and the Maleki publication. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Since the alleged teachings of the Hunziker patent do not compensate for the deficiencies of the Maleki publication with respect to claims 1 and 14 (discussed above), these claims are not rendered obvious by these references regardless of the presence or absence of an obvious reason to combine and/or modify them.

Claims 5, 18 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hunziker patent and the Maleki publication as applied to claims 1 and 14 above, and further in view of the Boyd publication. The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Since the alleged teachings of the Boyd publication do not compensate for the deficiencies of the Maleki publication and Hunziker patent with respect to claims 1 and 14 (discussed above), these claims are not rendered obvious by these references regardless of the presence or absence of an obvious reason to combine and/or modify them.

Claims 10-13 and 23-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hunziker patent and the Maleki publication as applied to claims 1 and 14 above, and further in view of U.S. Patent No. 6,169,194 ("the Thompson patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Since the alleged teachings of the Thompson patent do not compensate for the deficiencies of the Maleki publication and Hunziker patent with respect to claims 1 and 14 (discussed above), these claims are not rendered obvious by these references regardless of the presence or absence of an obvious reason to combine and/or modify them.

Claims 28-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hunziker patent and the Maleki publication as applied to claim 14 above, and further in view of the paper, Vollmer, et al., "Applied Physics Letter", Vol. 80, pp. 4057-4059 (2002) ("the Vollmer paper"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Since the alleged teachings of the Vollmer paper do not compensate for the deficiencies of the Maleki publication and Hunziker patent with respect to claims 1 and 14 (discussed above), these claims are not rendered

obvious by these references regardless of the presence or absence of an obvious reason to combine and/or modify them.

Claim 33 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hunziker patent and the Maleki publication as applied to claim 31 above, and further in view of U.S. Patent No. 5,872,623 ("the Stabile patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Since the alleged teachings of the Stabile patent do not compensate for the deficiencies of the Maleki publication and Hunziker patent with respect to claims 1 and 14 (discussed above), claim 33 not rendered obvious by these references regardless of the presence or absence of an obvious reason to combine and/or modify them. Furthermore, regardless of whether or not the Stabile patent discloses separate detectors, claim 33 also requires the use of a common light source. Thus, claim 33 is not rendered obvious for at least this additional reason.

#### New claims

New claim 40 depends from claim 1 and further recites two substantially parallel substrates accommodating each of the at least two optical cavities. New claim 41 depends from claim 40 and further recites



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that the at least one optical carrier is arranged between the two substantially parallel substrates. These claims are supported, for example, by Figure 9 and its corresponding description.

### Conclusion

In view of the foregoing amendments and remarks, the applicants respectfully submit that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

Any arguments made in this amendment pertain **only** to the specific aspects of the invention **claimed**. Any claim amendments or cancellations, and any arguments, are made **without prejudice to, or disclaimer of**, the applicants' right to seek patent protection of any unclaimed (e.g., narrower, broader, different) subject matter, such as by way of a continuation or divisional patent application for example.


Since the applicants' remarks, amendments, and/or filings with respect to the Examiner's objections and/or rejections are sufficient to overcome these objections and/or rejections, the applicants' silence as to assertions by the Examiner in the Office Action and/or to certain facts or conclusions that may be implied by objections and/or rejections in the Office Action (such as, for example, whether a reference constitutes prior art, whether references have been properly combined or

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modified, whether dependent claims are separately patentable, etc.) is not a concession by the applicants that such assertions and/or implications are accurate, and that all requirements for an objection and/or a rejection have been met. Thus, the applicants reserve the right to analyze and dispute any such assertions and implications in the future.

Respectfully submitted,

January 3, 2011



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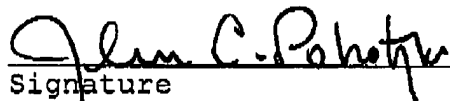
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January 3, 2011

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